PENDING CLAIMS

1. An array composition comprising:

a) a substrate with a surface comprising discrete sites;

b) a population of microspheres comprising at least a first and a second subpopulation, wherein each subpopulation comprises a bioactive agent, wherein said microspheres are distributed on said surface, and wherein at least one of said subpopulations does not have an optical signature; and

c) at least one fiducial.

2. An array composition according to claim 1 wherein at least one of said subpopulations comprises a unique optical signature.

3. An array composition according to claim 1 wherein each subpopulation comprises an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of said bioactive agent.

4. An array composition according to claim 1 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

5. An array composition according to claim 1 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducials, and each of said fiducials is a fiducial fiber.

6. An array composition according to claim 5 wherein at least one of said fiducial fibers has a different shape from the others.

7. An array composition according to claim 1 wherein said fiducial is a defined edge of said substrate.

8. An array composition according to claim 1 wherein said fiducial is a fiducial bead.

9. An array composition according to claim 1 wherein said bioactive agents are nucleic acids.

10. An array composition according to claim 1 wherein said bioactive agents are proteins.

11. An array composition according to claim 1 further comprising a computer readable memory comprising:

a) computer code that receives a first data image; and

b) computer code that registers said first data image using said fiducial to generate a first registered data image.

12. An array composition according to claim 11 wherein said computer readable memory further comprises:

a) computer code that receives a second data image;

b) computer code that registers said second data image using said fiducial to generate a second registered data image; and

c) computer code that compares said first and said second data image.

18. A method of making an array composition comprising:

a) forming a surface comprising individual sites on a substrate;

b) distributing microspheres on said surface such that said individual sites contain microspheres, wherein said microspheres comprise at least a first and a second subpopulations each comprising a bioactive agent; and wherein at least one of said subpopulations does not have an optical signature; and

c) incorporating at least one fiducial onto said surface.

19. A method according to claim 18 wherein said subpopulations further comprise an identifier binding ligand that will bind a decoder binding ligand for identification and elucidation of the bioactive agent.

20. A method according to claim 18 wherein at least one of said subpopulations further comprise an optical signature for identification and elucidation of the bioactive agent.

21. A method according to claim 18 wherein said substrate is a fiber optic bundle and said fiducial is a fiducial fiber.

22. A method according to claim 18 wherein said substrate is a fiber optic bundle, said array comprises at least three non-linear fiducials, and each of said fiducials is a fiducial fiber.

23. A method according to claim 22 wherein at least one of said fiducial fibers has a different shape from the others.

24. A method according to claim 18 wherein said fiducial is a defined edge of said substrate.

25. A method according to claim 18 wherein said fiducial is a fiducial bead.

26. A method according to claim 18 wherein said bioactive agents are nucleic acids.

27. A method according to claim 18 wherein said bioactive agents are proteins.

44. A composition according to claim 1, wherein said discrete sites are wells.

45. A composition according to claim 1, wherein said microspheres are randomly distributed on said substrate.

46. A method according to claim 18, wherein said discrete sites are wells.

47. A method according to claim 18, wherein said microspheres are randomly distributed on said substrate.

48. A method according to claim 19, wherein said identifier binding ligand is a protein.

49. A method according to claim 19, wherein identifier binding ligand is a nucleic acid.

50. An array composition according to claim3, wherein said identifier binding ligand is a protein.

51. An array composition according to claim 3, wherein identifier binding ligand is a nucleic acid.